

- 14 -

CLAIMS

1. An end station for an ion implanter, comprising  
a vacuum chamber arranged to receive an ion beam  
5 extending along a predetermined beam path in said  
chamber and having a chamber wall,  
a wafer holder for holding a wafer in a wafer  
plane,  
a scanning arm having a distal end supporting the  
10 wafer holder within the vacuum chamber and a proximal  
end attached to the chamber wall,  
said scanning arm having at least first and  
second rotary joints providing articulation of the arm  
to permit movement of said substrate holder in two  
15 orthogonal scan directions in a scan plane transverse  
to said beam path, and  
a scanning arm driver operative to move said  
substrate holder in said scan plane in a desired two  
dimensional scan pattern relative to said beam path.  
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2. An end station as claimed in Claim 1, including a  
third rotary joint mounting said substrate holder at  
said distal end of the scanning arm and having an axis  
of rotation normal to said wafer plane.  
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3. An end station as claimed in either of Claims 1  
and 2, including a fourth rotary joint mounting said  
proximal end of said scanning arm to said chamber wall  
and having an axis of rotation parallel to said scan  
30 plane, whereby rotation of the scanning arm at said  
fourth rotary joint rotates said scan plane relative  
to said beam path.
4. An end station as claimed in any preceding claim  
35 wherein said first and second rotary joints have axes  
perpendicular to said wafer plane, whereby said scan  
plane is parallel to said wafer plane.

- 15 -

5. An end station as claimed in Claim 3, wherein said first and second rotary joints have axes perpendicular to said wafer plane, and the axis of said fourth rotary joint lies in said wafer plane.
- 5 6. An end station as claimed in Claim 5, wherein the axis of said fourth rotary joint intercepts said beam path.
- 10 7. An end station as claimed in either of Claims 5 and 6, wherein the axis of said fourth rotary joint is perpendicular to said beam path.
- 15 8. An end station as claimed in Claim 2, wherein said first and second rotary joints have axes perpendicular to said wafer plane, and said scanning arm driver is operative to drive said third rotary joint so as to maintain the orientation of the wafer holder constant during said desired scan pattern.
- 20 9. An end station as claimed in any preceding claim, wherein said scan arm driver is operative to provide a linear orthogonal raster scan pattern of the substrate holder relative to the beam path, comprising parallel
- 25 linear scans of the wafer holder across the beam path separated by a predetermined scan pitch.
- 30 10. An end station as claimed in a predetermined claim, wherein said scanning arm driver comprises respective first and second motors driving said first and second rotary joints, and a motor controller controlling said first and second motors to provide said desired scan pattern.
- 35 11. A method of moving a workpiece in a desired two-dimensional scan pattern, comprising mounting the workpiece on a workpiece holder at

- 16 -

the distal end of a scanning arm with at least two rotary joints providing articulation of the arm to permit movement of said holder in two orthogonal scan directions in a scan plane,

- 5           and driving the scanning arm to move said holder in said scan plane in said desired two-dimensional scan pattern.

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